Document Approval Form

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Final	05-31-2014 Rev 06-10-2014	E. McCluskey and V. White	Simplified and consolidated copy of version 1.

Document Review and Approvals

Name/Title	Date	Initial Approval
Dean Hoffer Acting Head, Office of PSS	12-June-2014	Dean A. Hoffer
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CORRECTIVE ACTION PLAN

In response to the Surveillance Review Report of the Fermilab Research Alliance, LLC, Earned Value Management System (EVMS) dated August 19-20, 2013.

May 31, 2014

Revised June 10, 2014

Contents

Summary

This Corrective Action Plan (CAP) identifies the FRA/FNAL management actions and responses to the independent surveillance review of the certified FRA EVMS conducted at Fermilab on August 19-20, 2013. The Surveillance Review Team performed an examination of the FRA EVMS system and procedures, as well as the application of the EVMS to the NOvA project.

Fermilab has initiated several activities to improve the Project Management culture, practices, training and documentation. These include:

- Establishing a Project Management Planning Board
- Initiating a Project Management Improvement Initiative led by Paul Mantsch
- Hiring additional staff for the Office of Project Support Services
- A training program for project managers
- Commissioning a follow up review by Bob Wunderlich

Responses/actions to the principal findings of this review have been identified at both the project-specific level and at the FRA EVMS system level for all recommended corrective action reports (CARs), Continuous Improvement Opportunities (CIOs) and Root and Contributing causes identified. In addition, this CAP addresses specific comments within the body of report noted by the review team.

Consistent with the guidance of the review team, the CAP focuses on actions that would have the greatest impact on recently initiated and future projects and less on projects, including NOvA, which are nearly complete.

CAP responses/actions will be entered into the Fermilab action tracking system (iTrack) and regularly monitored for completion by the Head, Office of Integrated Planning and Performance Management. While all CARs and CIO* items require tracking to closure under DOE EVMS guidance, Fermilab management has also chosen to track other CIO actions to closure through iTrack.

CAR-01: Need for improved quality (meaningful, quantitative, complete) of variance analysis reports (VARs) and records to provide effective analysis of issues and proposed corrective actions.

VARs are inadequate for effective project management purposes; VARs were noted to be missing corrective actions and descriptions of variance impacts to budget, schedule milestones and/or critical path, explanations were generic or vague, and preparation was several months behind the occurrences. *This is a repeat issue from prior surveillances in March 2011 and March 2012***.**The NOvA project is not in compliance with the Fermilab EVMS System Description and procedure.

1.1 Institute a monthly review of remaining NOvA VARs to ensure that all active VARs meet laboratory-established quality attributes (prior to approval for new VARs.) The Head of OPSS will provide assistance as requested to ensure VARS meet quality standards.
Responsibility: ALD for Particle Physics (G. Bock)
Target completion date: July 1, 2014

1.2 Provide a monthly progress report on all open NOvA Project-responsible EVMS Surveillance Audit CAR/CIO responses/actions to the NOvA PMG and Fermilab Project Management Planning Board.
Responsibility: ALD for Particle Physics (G. Bock)
Target completion date (initial report): July 1, 2014

1.3 Define in simple matrix format the standard contents and quality attributes of a VAR, including the standards for timeliness in preparation and for complete and fully descriptive explanations, impacts and corrective actions. Incorporate this into relevant Fermilab EVMS procedures. Communicate expectations to Project management community..
Responsibility: PMII-SG (Elaine Mccluskey)
Target completion date: July 1, 2014

1.4 Provide an assessment of the progress of completion of any outstanding EVMS surveillance CARs and CIOs, with emphasis on repeat or persistent issues, to the Project Management Planning Board at each regular PMPB meeting.
Responsibility: Acting Head, Office of Project Support Services (D. Hoffer)
Target completion date: Aug. 30, 2014

1.5 Establish a set of "dashboard' performance indicators that present the current "health" and any negative trends in effectiveness of, and adherence to, the FRA EVMS system requirements.
Responsibility: Project Controls Manager, Office of Project Support Services (R. Marcum)
Target completion date: August 1, 2014

CAR-02: Coupling between risk management, Estimate-To-Complete (ETC), contingency, Management Reserve (MR) and Undistributed Budget (UB) accounts is not clearly defined and well understood across the NOvA CAMs. Some risks not quantified for cost and schedule impacts.

The identification of MR and UB on NOvA is not compliant with ANSI/EAI-748 or Fermilab EVM System description or procedure. The method and tools utilized to generate the ETC, EAC and evaluate available contingency created concerns with the accuracy of the ETC and the EAC reported to DOE, accuracy of the current MR and UB, and if remaining contingency is sufficient to cover remaining project risks. The EAC is not inclusive of all upcoming costs and so it is difficult to make an accurate assessment of remaining contingency, which prevents a full estimate of future conditions and likely sponsor future funding requirements. CAMs could not explain the methodology for evaluating ETC/EAC and were not confident that assessments of ETC for their Control Accounts were in the final project ETC/EAC.

2.1 Ensure that the NOvA project ETC is complete and reflects the full cost of work remaining on the project, including clear and consistent incorporation of the ETC analysis log, "assigned contingency" and risk mitigation actions so that all draws on contingency are filly accounted for.

Responsibility: ALD for Particle Physics (G. Bock)
Target completion date: May 1, 2014

2.2 Develop a flow diagram and a process description that captures the contributing factors and roles/responsibilities for CAMs and other project staff that are included in Project Manager's determinations of the Estimate-to-Complete and Estimate-at-Completion. Update the monthly reporting procedure to include this as clarification. Communicate the new information to Project Managers and direct them to ensure their CAMs understand these processes in order to ensure they take full ownership of their CA ETC.
Responsibility: Project Controls Manger (R. Marcum)
Target completion date: July 31, 2014

2.3 Develop a lab-wide process for projects to track and manage UB and MR in Cobra. Incorporate into appropriate EVMS system documents and provide training to CAMs and Project Controls staff.
Responsibility: Project Controls Manager, Office of Project Support Services (R. Marcum +S. Saxer)
Target completion date: July. 31, 2014

CAR-03: Need for additional CAM training in use of Fermilab EVMS policy so that system tools serve intended purpose. Training should include CAM roles, responsibilities and accountabilities.

This training issue results in non-compliance with ANSI/EAI-748. Despite initial/refresher training of NOvA project CAMs, the FRA EVMS management process is not fully instituted as a culture. Some CAMs were not using EVMS to effectively manage their Control Accounts and some viewed EVMS as more of a reporting than management tool and some CAMs had developed secondary processes for performance determination. On several newer projects (LHC CMS, Muon g-2) there is evidence that earlier implementation in the planning cycle instills greater confidence in EVMS use as a valuable management process.

3.1 Review/revise/develop/consolidate applicable laboratory guidance that comprehensively addresses the qualifications, training, assignment, system tools and R2A2s of CAMs for major projects at Fermilab. Brief/train clarified guidance to all Project Managers and affected project staff.
Responsibility: Acting Head, Office of Project Support Services (D. Hoffer)
Target completion date: Aug. 30, 2014

3.2 In the Project Management Plan template, write the roles/responsibilities of CAMS as well as the oversight responsibilities for project managers for CAM training and guidance.
Responsibility: PMII SG (Paul Mantsch or designee)
Target completion date (initial evaluation): August 31, 2014

CAR-04: Inconsistent identification and application of performance measurement techniques including Level-of-Effort (LOE.)

Some NOvA Control Accounts contain higher LOE values than recommended for accuracy of EVM reporting and several Control Accounts contained significant percent of LOE mixed with discrete work; there appeared to be no ownership of performance measuring techniques by the NOvA CAMs interviewed.

4.1 Incorporating feedback from current Project Managers and CAMs, review and revise as appropriate the current Lab EVMS guidance documents to clarify and standardize consistent application of performance measurement techniques. Communicate changes in the FRA approach to project managers and project controls staff. Validate the approach is being applied through the CD-2 Director's Reviews for CMS, Muon g-2, and Mu2e Projects in 2014.

Responsibility: Project Controls Manager (R. Marcum)

Target completion date: August 31, 2014

CAR-05: Potential for schedule integrity issues (critical path) resulting from lags, missing logic/relationships and constraints.

The NOvA project is not in compliance with ANSI/EAI-748 or the FRA EVM System Description regarding scheduling and scheduling dependencies. *This is an unresolved repeat concern from prior surveillances in March 2011 and March 2012.*

The work scope on NOvA does not fully utilize logically sequenced activities and interdependencies required to meet project milestones and generate critical path schedules. The project schedule contains open relationships, constraints and lags (22% on in-progress work), which were not understood by CAMs; CAMs minimally used available scheduling data. There appears to be minimal interest in the project schedule at the CAM level.

5.1 Verify project schedule integrity in pre-CD milestone review preparation to reduce/eliminate open ends, lags and constraints; issues from prior schedule reviews/reports, scheduling system analysis reports and the disciplined approval and incorporation of schedule change requests should be part of this verification, among other factors.

Responsibility: Head of Project controls (Richard Marcum)

Target completion date: August 1, 2014

CAR-06: Ensure that baseline changes to the current performance period do not occur ("rubber baseline.")

The NOvA project is not in compliance with ANSI/EAI-748 or the FRA EVM System Description regarding implementing of changes. Work packages have been added to the baseline schedule with start date within the current performance period, a practice not in agreement with the standards noted.

6.1 Review/revise the Project Management Plan template to require each project to establish a Change Control Board, including membership, functions and roles/responsibilities. Consider utilizing the PMG as a CCB with defined CCB roles. Include within the roles/responsibilities of the CCB the provision to verify compliance with the applicable FRA EVMS procedures that govern the changing of the scheduled start date of work within the current performance period.

Responsibility: PMIISG (Paul Mantsch or designee) and Acting Head, Office of Project Support Services (D. Hoffer)

Target completion date: August 31, 2014

CIO*-01: Clarify level of integrated impact analysis in the change control process.

NOvA change requests are evaluated within the management line of the CAM, but a fully cross-functional analysis of project change requests that includes affected division and project management, ESH&Q, facilities engineering and other key areas of the project can reduce the risk of unidentified impacts. The existing PMG membership may contain the expertise to perform such a role.

7.1 Work with the project managers to review/revise applicable laboratory procedure on project change control to include responsibilities (including communicating at the appropriate levels) and factors to consider when performing an integrated impact analysis of a proposed change request. Add this information to the template/requirements for Project Management Plans.
Responsibility: PMIISG (Paul Mantsch or designee)
Target completion date: August 31, 2014

CIO-01: Unclear accounting for spares and associated distribution of scope/budgets/costs.

Several NOvA Control Accounts (CAs) included budgets to purchase spares, costs that were later transferred/sold to Laboratory inventory accounts. The anticipated credit for the transfer/sale was made to a separate CA, which inflates the actual project cost in the original CAs. In addition, CAMs could not explain and did not have a clear understanding of these spares transactions affecting their CAs.

8.1 Consider moving the budget for the sales of the NOvA spare parts to inventory into the appropriate CA.
Responsibility: ALD for Particle Physics (G. Bock.)
Target completion date: May 1, 2014

8.2 Revise appropriate financial procedures to ensure that the budgeting and accounting for the purchase and sale of spares in the same CA. Ensure that the PMs communicate the project spares policy to the CAMs and that this is included PM training.
Responsibility: CFO (Cindy Conger)
Target completion date: August 30, 2014

CIO-02: Limited level of detail in NOvA WBS Dictionary (total scope, limited quantification.)

Detailed work scope was not flowed down to the Control Account level of the WBS dictionary. Several NOvA CAMs were unsure of content specified in their responsible portion of the WBS Dictionary. Several WBSL2 lacked specific work scope with quantifiable equipment/device numbers. The NOvA WBS Dictionary, and the WBS Dictionaries of two new projects—CMS and Muon g-2-- do not provide the complete information required by the FRA EVMS procedure.

9.1 Advise Project Managers to review/revise the WBS Dictionaries to ensure that all information required by EVMS procedure is present at least the CA level.
Responsibility: Acting Head, Office of Project Support Services (D. Hoffer)
Target completion date: July 31, 2014

CIO-03: Reduced indirect rates for special procurements are assessed at the beginning of the contract as opposed to over the life of the contract.

Much of the early procurement work may take place before the contract is awarded, the work benefits the project over the contract life. On-going indirect support costs are not assessed once the $500K cap is realized, which shifts the costs of these indirect activities to other unrelated projects.

10.1 On all project procurements that qualify for the special rate, consider modifying the application of indirect expense to assess the overhead as the benefit is received (over the contract life) though: (1) estimating the indirect benefit at the start of the contract and then apply it over the contract life; or (2) restart the $500K procurement cap at the beginning of the fiscal year to recognize that certain procurement and financial support activities are required throughout the life of the award.
Responsibility: CFO (C. Conger)
Target completion date: June 30, 2014

CIO-04: Consider consequences of routine accounting adjustments (e.g., rate adjustments) and involve CAMs directly on impact analysis.

Change requests to make adjustments (credits) to some NOvA CAs resulted in erroneous Level-of-Effort percentages (i.e., >100%) and increased variances, consequences of which were not recognized or understood by the responsible CAMs. CAMs were not involved in the Change Request **.**

11.1 Communicate the importance of routine accounting adjustments to project managers who will then work with their project controls staff and CAMs to understand possible impacts on EVMS reporting.
Responsibility: Project Controls Manager (R. Marcum)
Target completion date: July 31, 2014

Root/Contributing Causes (RCC) to issues that are important to preventing Fermilab from fully implementing an effective EVMS.

RCC-01: CAM Roles, Responsibilities, Authorities and Accountabilities.

At least four (CAR-01, CAR-02, CAR-03, CAR-04) of the six recommended corrective actions involve the need for Fermilab management to establish clear expectations for the CAMs, provide the necessary training, and developing a process which regularly evaluates CAM performance to ensure that project-wide implementation is occurring. Fermilab management action is needed to ensure that the CAM functions are being met, including screening and/or mentoring of staff in CAM assignments. During interviews, NOvA CAMs could not consistently articulate their roles and responsibilities and did not make full use of the FRA EVMS management and reporting capabilities. CAMs did not “own” the baseline. Corrective actions concerning CAM effectiveness were identified in previous surveillances. There is a need for increased focus

on CAMs working with the Project Managers to develop these roles. Pro-active support from senior lab and project leadership will encourage a culture where the full EVMS process can be an effective management tool.

Lab management Response: *The corrective actions to the noted CARs and CIO*-01 provide extensive attention to CAM selection, training and identification of methods for senior lab and project management to take steps to improve the culture of effective management within the EVMS system.*

RCC-02: Repeat Issues.

Several corrective actions were previously identified in prior surveillances, including poor schedule quality and management-approved corrective actions that were ineffective in implementation. Most of the issues identified in the March 2012 Surveillance review remain unresolved. Confirmation/validation reviews associated with corrective action closeout need to be more rigorous. Fermilab management needs to ensure that formal closeout of corrective actions will provide for the effective implementation of the FRA EVMS as well as ensure that results are sustainable. The Corrective Action Plan should identify responsible leads in the Fermi management structure that have a continuing responsibility and accountability to ensure corrective actions are sustainable.

Lab Management Response: *Repeat issues were confined to a specific project (NOvA) and are not indicative of endemic issues in other projects. Nevertheless actions have been identified within this CAP to improve EVMS procedures, training and oversight. The actions in this Corrective Action plan will be tracked to closure. Roles and responsibilities in the Project Management System assign responsibility for the EVMS system to OPSS and for CAM training and adherence to processes to Project Managers.*

RCC-03: Timely implementation of the EVMS.

Fermilab projects under development were noted to be implementing the FRA EVMS early in the development process. While the completion of the NOvA project relies on the collection, analysis and reporting of the detailed detector manufacturing data, the early implementation of EVMS on the developing projects will have the more significant impact on the overall effectiveness of the FRA EVMS. The EVMS Corrective Action Plan should address how the FRA EVMS will be implemented on new and developing projects.

Lab Management Response: *Early implementation of EVMS as noted in the report will be required on each project, with support from the Project Controls staff through OPSS. Management oversight of projects via the monthly Project Oversight Group (POG) includes attention to the timely implementation of EVMS for each project.*

RCC-04: Ensuring an Adequate Support Function.

Important EVMS activities, like modifying the EVMS Systems Description and EVMS procedures, were not completed until the surveillance review. As Fermilab moves to implement its mission through a large number of projects, the R2A2 for the Office of Project Support Services should be evaluated and a gap analysis performed to compare the size/make-up of this organization to ensure that the required project management functions, both line and support, can be effectively performed. It is necessary for Fermilab

management to ensure that the right mix of staff (line and support) is available to perform the EVMS functions.

Lab Management Response: *The COO has initiated multi-year staff and budget planning for the functions performed by OPSS and has initiated hiring and tailored assignments of project controls and other project support expertise to support current and future projects over a 3-year window.*